UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,692	08/24/2001	Hirosumi Suzuki	109676	9657

25944 7590 05/14/2007

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
JARRETT, SCOTT L	
ART UNIT	**PAPER NUMBER**
3623	

MAIL DATE	DELIVERY MODE
05/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/935,692	SUZUKI ET AL.	
	Examiner	Art Unit	
	Scott L. Jarrett	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24 and 28-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24 and 28-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This **Final** Office Action is responsive to Applicant's amendments filed February 21, 2007. Applicant's amendment filed February 21, 2007 amended claims 1-22 and 28-30 and canceled claims 25-27. Currently Claims 1-24 and 28-30 are pending.

Response to Amendment

2. The Objection to Claims 1, 12 and 13 are withdrawn in response to Applicant's amendments to Claims 1, 12 and 13.

The rejection under 35 U.S.C. 102(b) of Claims 1-24 and 28-30 based upon a public use or sale of the invention is withdrawn.

Response to Arguments

3. Applicant's arguments filed February 21, 2007 have been fully considered but they are not persuasive. Specifically Applicant's argue that the prior art of record fails to teach or suggest:

- reiteratively changing a distribution and workforce parameter as recited in independent claims 1, 12 and 13 (Last Paragraph, Page 12);
- calculating a gross personnel cost by *reiteratively adjusting, in nested sequence,* the number of workers distributed to the worker categories, tact time and planned production volume to each of the production lines, as recited in independent claim 23 (Last Paragraph, Page 12;

Paragraph 1, Page 13; Paragraphs 3-4, Page 16; Paragraphs 2-3, Page 17);

- a plurality of production lines capable of producing different articles or services (Paragraph 3, Page 13; Last Paragraph, Page 14; Paragraph 1, Page 15)

Additionally Applicant's remarks filed February 21, 2007 further argue that there is no motivation to combine:

- the production/supply planning methods disclosed in the Chase reference (Last Paragraph, Page 13; Paragraph 1, Page 14); and
- the Chase and DeMatta references.

Further Applicant's request support for the officially cited fact that it is well known to operation production facilities during non-regular hours/times wherein the irregular time includes rates/costs different from regular operations (Paragraph 3, Page 15).

In response to Applicant's argument that the prior art of record fails to teach or suggest *reiteratively* changing a distribution and workforce parameter (e.g. iteratively changing the number/level and type of workforce personnel to meet production plan requirements/constraints) and that the prior art of record fails to teach or suggest calculating a gross personnel cost by *reiteratively adjusting, in nested sequence,* the number of workers distributed to the worker categories, tact time and planned production volume to each of the production lines the examiner respectfully disagrees.

As an initial matter it is noted that iteratively (successively, multiple times, in succession, etc.) adjusting (varying, changing, etc.) parameters is a common approach/step of nearly all optimization problems, which seek to determine the optimal set of parameter values out of a plurality of potential parameter values

Support that the prior art of record teaches reiteratively adjusting, in a nested sequence (repeatedly, to do again, a loop, repetitive, more than once, over and over, iteratively, trial and error, successively, iterate, etc.), the distribution and workforce parameters as part of the drafting on a supply plan is evidenced by at least the following references:

- Chase et al, Production and Operations Management – Seventh Edition (1995), teach *reiteratively* (successively, recursively, repeatedly, iteratively, trial-and-error, cut-and-try, etc.) changing the distribution of the required station supply volumes (line balancing, leveling) and workforce parameter (production leveling, production smoothing, linear programming, simplex method, etc.; Last Paragraph, Page 520; Paragraph 2, Page 518; Pages 347-348; 532-533; Paragraph 1, Page 647; Exhibits 13.12, S16.2) to a plurality of production lines/supply stations (facilities, lines, cells, workstations, etc.).;
- Costanza, U.S. Patent No. 6,198,980, teaches balancing the production line and resources by *reiteratively* (iteratively, successively, repeatedly, recursively, etc.) adjusting, in nested sequence, the number of workers distributed to the worker categories, tact time and the production volume

allocated each of the workstations (resource balancing, production/product synchronization; Column 5, Lines 1-25; Column 11, Lines 48-65; Column 20, Lines 30-55; Figure 6);

- Doerr et al., Synchronous Unpaced Flow Lines with Worker Differences and Overtime Cost (2000): Section 4 Optimization Procedure, Column 2, Page 425-Column 1, Page 426; and
- Sparling, Balancing Just-In-Time Production Units: The N U-Line Balance Problem (1998), teaches *iteratively* solving a "multi-station assignment problem" wherein the method assigns (distributes) the tasks (supply volume) in multi-line subsets to stations (Steps 2.3-2.4, Page 223).

In response to Applicant's argument that the prior art of record fails to teach or suggest planning for a plurality of production lines the examiner respectfully disagrees.

As an initial matter that the supply plan is for a plurality of production lines (manufacturing, assembly lines, sites, plants, facilities, etc.) that produce different articles *or* services, the recitation "in a plurality of production lines" has not been given patentable weight because the recitation occurs in the preamble of claims 1, 12 and 13. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190

USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Further the Applicant's arguments seem to imply that the supply planning system and method *simultaneously* plans a plurality of production lines however it is noted that this feature/limitation is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further support that the prior art of record teaches generating (drafting) production/supply plans for/across a plurality of production lines/supply stations is evidenced by at least the following references:

- Chase et al., teaches a supply plan drafting method and system for a plurality of product lines (capacity planning, Numbers 1-3, Page 326; Paragraphs 3-7, Page 405; Steps 1-7, Page 407; Page 410; aggregate planning, Pages 514, 517; Paragraphs 1-2, Page 518);
- DeMatta et al., Dynamic Production Scheduling For A Process Industry (1994): Column 1, Paragraphs 2-3, Page 493; Column 2, Paragraphs 2-3, Page 493; Column 2, Page 494; Column 1, Last Paragraph, Page 496; Column 2, Paragraph 3, Page 501;
- Graves, Manufacturing Planning and Control (1999), Last Two Paragraphs, Page 11;
- Greene, Production and Inventory Control Handbook (1997): assignment and allocation of production demand; Paragraphs 2-3, Page

15.5; "What products will be produced at each plant", "How demand should be allocated among plants", "How demand should be allocated among process trains" (i.e. production lines), Table 15.1;

- Inman et al., Integrated Assembly Line Loading, Design and Labor Planning (1997), teaches a method for drafting a supply plan for a plurality of production lines (machines, cells, departments, etc.) that produce more than one article or service (model) wherein the plan maximizes labor utilization by determining the speed (pace) at which each line will run, which products to produce on which lines and the number of workers assigned to each line in order to meet article demand (Column 1, Page 315; Column 1, Page 316; Figures 1-2).

Inman et al. further teaches that a joint venture between Toyota and GM operates using a "similar program" to the supply plan drafting method disclosed and that "A key just-in-time principle is to build every product every day."; and

- Sparling teaches drafting a supply plan for a plurality of production lines (N U-Lines, JIT Production Units, etc.) in an analogous art of supply/production planning for the purposes of "balance an entire production facility simultaneously, minimizing the total labour force" (Paragraph 3, Page 217; Assumptions 1-13, Page 200; Section 3, Pages 222-224; Paragraph 1, Page 234).

Sparling further teaches that U-Line/Multi-Station balancing

problems are old and very well known and commonly used in Just-In-Time Manufacturing environments wherein JIT facilities produce "several distinct type of products, each with its own production lines" wherein "the cycle time for any U-line is determined by demand for the product produced on that line" (Paragraph 2-3, Page 214; Figure 3).

Support that the prior art of record teaches a plurality of production lines capable of producing different articles *or* services (e.g. mixed-model production) is evidenced by at least the following references:

- Chase et al.: Exhibit 6.5, Last Paragraph, Page 243; Last Paragraph, Page 323; Page 412; Last Paragraph, Page 411; Paragraph 5, Page 413; Number 1, Page 533;
- Coleman et al., Heijunka A Key to the Toyota Production System (1994): Column 2, Paragraph 2, Page 31; Column 1, Last Paragraph, Page 33; Column 2, Page 33;
- DeMatta et al.: Abstract; Column 1, Paragraphs 2-3, Page 493; Column 2, Paragraphs 2-3, Page 493; Column 2, Page 494;
- Giles et al., Meeting Customer Demand Through Mixed Model Manufacturing (1997): Pages 83, 86;
- Greene: Product Line Mix, Paragraphs 2-3, Page 8.5; Line Loading, "manpower requirements will typically be a function of the product mix

and the line speed of daily going rate", Paragraph 2, Page 8.10; Figure 8.1;

- Inman et al.: Column 1, Page 315; Column 1, Page 316; Figures 1-2; and
- Lee et al., Workforce Planning in Mixed Model Assembly Systems (1997): Column 1, Paragraph 2, Page 554.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In the present case the plurality of production/supply planning methods disclosed Chase (Last Paragraph, Page 13; Paragraph 1, Page 14) represent the supply drafting methods well known to those skilled in the art at the time of the invention wherein it is common practice for those skilled in the art to use elements from several supply planning methods in order to optimize the supply plan and/or it would have been obvious to one skilled in the art at the time of the invention to try various combinations of the well known methods disclosed in Chase in order to achieve the well known and desired result of optimizing the supply plan.

In regards to the combination of Chase and De Matta et al., both references are in the an analogous art of drafting a supply plan for a plurality of production lines capable of producing/supplying an article or service wherein DeMatta et al. teaches continually revising (assigning/re-assigning) the distribution of the required supply volumes to plurality of production lines in order to meet the overall required supply volume and minimize production costs (DeMatta et al.: Column 1, Lines 493; Column 1, Last Paragraph, Page 496; Column 2, Page 501). Accordingly it would have been obvious to one skilled in the art at the time of the invention to continually revise any of the plurality of commonly used supply plan parameters including but not limited to workforce and distribution parameters in an effort to optimize the supply plan.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to Applicant's request for support for the officially cited fact that it is known to operate production facilities during "non-regular" hours wherein the irregular hours includes nights, weekends, overtime, holidays, extra shifts, longer/expanded shifts or the like wherein irregular operations are typically employed to meet product

demand that can not be met with regular operations the examiner has provided the following references:

- Chase et al. teach a system and method for drafting a supply chain wherein the workforce parameter includes regular full-time, part-time, contract workers and regular and overtime pay rates (Pages 318, 326, 410, Paragraph 2, Page 518; Paragraph 2, Page 527; Paragraph 4, Page 529; Exhibits 13.2, 13.5-13.8);
- Chopra et al., Supply Chain Management (2001): Chapter 5.3 Aggregate Planning Strategies, Pages 104-105; Bullets 1-2, 8-9, Page 107; Bullet 3, Page 123;
- DeMatta et al.: Column 2, Last Paragraph, Page 429;
- Doerr et al.: "Throughout this paper we assume that the line is assigned a daily production quota. If the number of items produced is less than this quota, the line must work overtime until the quota is met.", Column 1, Paragraph 2, Page 421; Abstract; Column 1, Paragraph 1, Page 423; Column 1, Page 424;
- DuCote et al., A Design of a Personnel Scheduling Software for Manufacturing: Paragraph 1, Page 474;
- Evans et al., A Generalized Lagrange Multiplier Algorithm For Optimum or Near Optimum Production Scheduling (1972): Abstract, Page 300, 311;

- Greene: Paragraphs 1-2, Bullets 1-2, 5, Page 8.3; Product Line Mix, Paragraphs 2-3, Page 8.5; Multiple Shifts and Overtime Considerations, pages 8.32-8.33;
- Lippman et al., Optimal Production Scheduling and Employment Smoothing With Deterministic Demands (1967): Pages 128-129,132, Equation 2.7; and
- Parker et al., A Decision Support System for Personnel Scheduling in a Manufacturing Environment (1994): Column 1, Paragraph 2, Page 186.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-22 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chase et al., Production and Operations Management – Seventh Edition (1995) in view of De Matta et al., Dynamic Production Scheduling For Process Industry (1994).

Regarding Claims 1 and 12-13 Chase et al. teach a system and method for drafting a supply plan of an article or service comprising (Pages 407, 410, 519, 528-529, 531, 638-639, 644-647; Exhibits 3.13-3.14, 13.1-13.7, 6.5, 6.8, 10.1, 16.3-16.6, 16.10, S16.1, S16.2):

- storing unit supply man-hour data and time required to supply the article/service *or* the service per unit and unit work-force-type-based cost data cost data on cost per unit according to work force types (production rates, costs, etc.; Paragraphs 2-3, Page 243, Page 517; Exhibits 6.5, 13.1-13.12);

- inputting an entire required supply volume of the article/service (demand, production requirement; Exhibit 13.4);

- distributing (assigning, allocating, allotting, etc.) the required supply volume to station (workstation, workers, machines, cells, plants, lines, groups, plants, etc.) supply volumes to be supplied from the supply stations (aggregate production planning, capacity planning, assignment problem, assembly line balancing, hierarchical planning process, order planning, personnel scheduling, job-shop scheduling, uniform plant loading, balance workstation capacities, etc.; Paragraph 1, Page 513; Paragraph 1, Page 514; Paragraphs 2-3, Page 515; Number 1, Page 637; Pages 638-639; Last Paragraph, Page 644; Exhibits 6.8, 13.1, 13.2, 13.5);

- calculating a station supply man-hour required to supply the article/service of the distributed supply volume based on the unit supply man-hour data and setting a work-force-type based a work force parameter (Page 407; Paragraphs 1-2, Page 517; Table, Page 521; Exhibits 10.1, 13.5);

- calculating a gross cost to supply the station supply volume based on the work-force type and unit work-force type cost data (Number 1, Page 520; Exhibits 13.5-13.7, 13.9);

- reiteratively (successively, recursively, repeatedly, iteratively, trial-and-error, cut-and-try, etc.) changing the distribution of the required station supply volumes (line balancing, leveling) and workforce parameter (production leveling, production smoothing, linear programming, simplex method, etc.; Last Paragraph, Page 520; Pages 347-348; 532-533; Paragraph 1, Page 647; Exhibits 13.12, S16.2); and

- selecting and using a revised workforce parameter and distribution of the station supply volumes corresponding to a minimum gross cost (e.g. selecting a

production planning strategy; Paragraph 2, Page 518; Paragraph 1, Page 647; Exhibit 13.5-13.7, 13.11).

Chase et al. does not expressly teach distributing the required supply volume to station supply volumes to be supplied from the supply stations *based on a distribution parameter* as claimed.

De Matta et al. teach distributing the required supply volume to station supply volumes to be supplied from the supply stations *based on a distribution parameter* (X_{ijts}) and workforce parameters (Abstract; Column 2, Page 494, Column 1, Page 495; Section 4, Pages 496-497; Column 1, Page 501) in an analogous art of drafting a supply plan for the production of an article on multiple production lines (Column 1, Page 493) for the purposes of drafting a facility wide supply plan wherein the distribution of the required supply volumes to stations/production lines is continually revised (assigned/re-assigned) of in order to meet the overall required supply volume and minimize production costs (Column 1, Lines 493; Column 1, Last Paragraph, Page 496; Column 2, Page 501).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a supply plan of an article as taught by Chase et al. with its utilization of well known aggregate production planning, capacity planning, assembly line balancing and uniform plant loading to do such things as balance

workstation capacities would have benefited from distributing the required supply volume to station supply volumes to be supplied from the supply stations *based on a distribution parameter* in view of the teachings of De Matta et al.; the resultant system/method enabling businesses to assign/re-assign (i.e. continually adjust) of the required supply volume to a plurality of production lines in order to meet the overall required supply volume and minimize costs (De Matta et al.: Column 1, Lines 493; Column 1, Last Paragraph, Page 496; Column 2, Page 501).

Regarding Claims 2 and 14 Chase et al. teach a system and method for drafting a supply plan wherein the distribution of the required station supply volumes changes within a suppliable range of the supply stations (capacity constraints, capacity planning, resource availability; Paragraph 2, Page 518; Pages 318, 326, 535-536; Exhibit 13.5).

Regarding Claims 3 and 15 Chase et al. teach a system and method for drafting a supply plan wherein the suppliable range includes (constraints, capacity planning, etc.; Pages 318, 326, 410, 528-529; Exhibits 13.2, 13.5-13.8):

- regular operations range and costs; and

- irregular operations ranges and costs including having overtime and other irregular operation ranges/service ranges and costs (off-season, extra hours, etc.).

Regarding Claims 4 and 16 Chase et al. teach a system and method for drafting a supply plan wherein the irregular suppliable range includes an overtime suppliable

range based on overtime service (constraints, capacity planning, etc.; Pages 318, 326, 410, 528-529; Exhibits 13.2, 13.5-13.8) and the irregular operation unit-work-force-type based cost data includes overtime costs data for the work-force types.

Chase et al. does not expressly teach a holiday service suppliable range based on holiday service as claimed.

Official notice is taken that operating production facilities during "non-regular" hours is old and very well known wherein the irregular hours includes nights, weekends, overtime, holidays or the like wherein irregular operations are typically employed to meet product demand that can not be met with regular operations (i.e. increase capacity of the line, plant or workstation).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a supply plan with its ability to plan for a plurality of irregular operating times/alternatives (overtime) as taught by the combination of Chase et al. and De Matta et al. would have benefited from accounting/planning for any of a plurality of well known irregular operations times and costs in view of the teachings of official notice; the resultant system being capable of meeting demand through the utilization of irregular operations such as holidays, weekends or the like.

Regarding Claims 5 and 18 Chase et al. teach a system and method for drafting a supply plan further comprising change the ratio of work-force-types as a factor of the workforce parameter (Paragraph 1, Page 513; Number 2, Page 519; Pages 528-529; Number 3, Page 638; Exhibit 13.11).

Regarding Claims 6 and 19 Chase et al. teach a system and method for drafting a supply plan wherein the work-force-types include regular and a plurality of types of temporary employees and changing the ratios of work-force-types by changing percentages (ratio, mix, etc.) of types of temporary employees (Paragraph 1, Page 513; Number 3, Page 638; Exhibits 13.5, 13.11).

Regarding Claims 7 and 20 Chase et al. teach a system and method for drafting a supply plan further comprising changing (reiteratively, repeatedly, successively, etc.) the workforce in each of the supply stations as a factor of the workforce parameter (Paragraph 1, Page 513; Paragraph 1, Page 514; Paragraphs 2-3, Page 515; Number 1, Page 637; Pages 638-639; Last Paragraph, Page 644; Exhibits 6.8, 13.1, 13.2, 13.5).

Regarding Claims 8 and 21 Chase et al. teach a system and method for drafting a supply plan further comprising change a gross workforce in the supply stations within a workforce changeable range of the supply stations (capacity planning, production/order assignment, etc; Pages 318, 326, 410, 528-529; Exhibits 13.2, 13.5-13.8).

Regarding Claims 9, 17 and 22 Chase et al. teach a system and method for drafting a supply plan wherein the parameters are changed (reiteratively, periodically, successively, etc.) at a predetermined interval for each of the parameters (re-balancing, re-planning, yearly, annually, quarterly, monthly, daily, etc.; Paragraph 1, Page 514; Paragraphs 2-3, Page 515; Exhibits 13.1-13.2).

Regarding Claims 10-11 Chase et al. teach a system and method for drafting a supply plan wherein (Paragraphs 2-3, Page 243, Page 517; Exhibits 6.5, 13.1-13.12):

- the supply stations are production lines (assembly lines, cells, groups, plants, etc.) for producing an article/performing a service; and

- the unit supply man-hour data are data on the workforce and time required to produce a single unit of the article/service.

Regarding Claims 28-30 Chase et al. teach a system and method for drafting a supply chain wherein the workforce parameter includes regular full-time, part-time, contract workers and regular and overtime pay rates (Pages 318, 326, 410, 528-529; Exhibits 13.2, 13.5-13.8).

Chase et al. does not expressly teach holiday pay rates as claimed.

Official notice is taken that operating production facilities during non-"regular" hours/times wherein the irregular time includes rates/costs typically different from regular operations (e.g. time and a half, etc.) is old and very well known wherein the irregular hours includes nights, weekends, overtime and holidays as the like wherein irregular operations are typically employed to meet product demand that can not be met during regular operations.

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a supply plan with its ability to plan for a plurality of irregular operating times/alternatives (overtime) as taught by the combination of Chase et al. and De Matta et al. would have benefited from accounting/planning for any of a plurality of well known irregular operations times and costs in view of the teachings of official notice; the resultant system being capable of meeting demand through the utilization of irregular operations such as holidays, weekends or the like.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable Costanza, John, U.S. Patent No. 6,198,980 in view of Sparling, David, Balancing Just-In-Time Production Units: The N U-Line Balance Problem (1998) and further in view of A Decision Support System (Software) for Personnel Scheduling in a Manufacturing Environment (DSSPS) as evidenced by at least the following:

I. Parker et al., A Decision Support System for Personnel Scheduling in a Manufacturing Environment (1994), herein after reference A; and

II. Ducote et al., A Design of Personnel Scheduling Software for Manufacturing (1999), herein after reference B.

Regarding Claim 23 Costanza teaches a system and method for drafting a production plan for producing an article in a mixed-model production line every plan including plan including a plurality of operating days comprising (Abstract; Figures 2, 4-6):

- allocating, provisionally (initially, temporarily, etc.), a planned production volume a production line (demand-at-capacity) and a plurality of workstations (cells) during the plan-execution period (Column 3, Lines 33-65; Column 14, Lines 24-64);

- calculating an operating time in each of the production lines during the plan-execution period corresponding to a determined takt time (production rate) in each of the production lines (stations, cells, groups, plans, etc.) based on the production volume, a relation between takt time, planned production volume and operating time (operational cycle time) in each of the workstations and the production line (Column 3,

Lines 33-65; Column 4, Lines 4-29; Column 9, Lines 15-26; Column 19, Lines 1-68; Column 20, Lines 30-55);

- calculating the number of workers required in each of the workstations and production line based on the set operating time (Column 4, Lines 4-29 and 54-58; Column 5, Lines 1-25);

- balancing the production line and resources by reiteratively (iteratively, successively, repeatedly, recursively, etc.) adjusting, in nested sequence, the number of workers distributed to the worker categories, tact time and the production volume allocated each of the workstations (resource balancing, production/product synchronization; Column 5, Lines 1-25; Column 11, Lines 48-65; Column 20, Lines 30-55; Figure 6).

Costanza does not expressly teach calculating a personnel cost in each of the workstations and production line after distribution of the calculated number of workers to worker categories with different hourly wages or subsequently calculating a gross personnel cost in all of the production lines by summing the personnel costs in the respective production lines wherein the cost is determined by reiteratively adjusting, in nested sequence, the number of workers distributed to the worker categories, tact time and the production volume allocated each of the production lines as claimed.

DSSPS teaches calculating a personnel cost in each of the workstations of a production line after distribution of the calculated number of workers to worker

categories with different hourly wages and subsequently calculating a gross personnel cost in all of the workstations of the production line by summing the personnel costs in the respective workstations wherein the cost is determined by reiteratively adjusting, in nested sequence, the number of workers distributed to the worker categories, tact time (operational cycle time) and the production volume allocated each of the workstations (reference A: Column 1, Paragraphs 2-3, Page 185; Column 1, Paragraphs 1-4, Page 186; Column 1, Paragraphs 1-2, Page 187; Column 2, Paragraphs 1-3, Page 187; reference B: Abstract; Page 474, Paragraphs 2, 4, Page 476) in an analogous art of drafting a supply/production plan for the purposes of enabling business to generate personnel schedules (plans) for a mixed/flexible workforce comprising a plurality of work-force-types (reference A: Last Bullet Page 187; Bullets 1-2, 6, Page 188).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a production plan for a plurality of workstations in a mixed-model production line as taught by Costanza would have benefited from utilizing and planning for a plurality of well known work-force-types by calculating the personnel costs and schedules for the plurality of work-force-types as taught by DSSPS; the resultant system/method enabling business to generate personnel schedules (plans) for a mixed/flexible workforce comprising a plurality of work-force-types (DSSPS reference A: Last Bullet Page 187; Bullets 1-2, 6, Page 188).

Neither Costanza nor DSSPS expressly teach drafting a supply plan for a plurality of production lines as claimed.

Sparling teaches drafting a supply plan for a plurality of production lines (N U-Lines, JIT Production Units, etc.) in an analogous art of supply/production planning for the purposes of "balance an entire production facility simultaneously, minimizing the total labour force" (Paragraph 3, Page 217; Assumptions 1-13, Page 200; Section 3, Pages 222-224; Paragraph 1, Page 234).

Sparling further teaches that U-Line/Multi-Station balancing problems are old and very well known and commonly used in Just-In-Time Manufacturing environments wherein JIT facilities produce "several distinct type of products, each with its own production lines" wherein "the cycle time for any U-line is determined by demand for the product produced on that line" (Paragraph 2-3, Page 214; Figure 3).

Sparling teaches iteratively solving a "multi-station assignment problem" wherein the method assigns (distributes) the tasks (supply volume) in multi-line subsets to stations (Steps 2.3-2.4, Page 223).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a production plan for producing an article in a production line as taught by the combination of Costanza and DSSPS would have benefited from being adapted to account for the well known utilization of multiple mixed-model production lines in view of the teachings of Sparling; the resultant system and

method enabling businesses to "balance an entire production facility simultaneously, minimizing the total labour force" (Paragraph 3, Page 217) and/or balance multiple U-Lines in a JIT production unit (group of U-Lines) simultaneously thereby increasing the productivity of the facility/group of production lines (Paragraph 1, Page 234).

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Costanza, John, U.S. Patent No. 6,198,980 in view of Sparling, David, Balancing Just-In-Time Production Units: The N U-Line Balance Problem (1998) in view of A Decision Support System (Software) for Personnel Scheduling in a Manufacturing Environment (DSSPS) as evidenced by at least the following:

I. Parker et al., A Decision Support System for Personnel Scheduling in a Manufacturing Environment (1994), herein after reference A; and

II. Ducote et al., A Design of Personnel Scheduling Software for Manufacturing (1999), herein after reference B

as applied to claim 23 above, and further in view of Kiritsis et al., Petri net techniques for process planning cost estimation.

Regarding Claim 24 Costanza does not expressly teach calculating costs utilizing a Petri net model as claimed.

Kiritsis et al. teach cost estimation in manufacturing/production processes utilizing Petri net model (Process Planning Cost system, Process Planning Net) wherein "In order to determine the overall costs for feasible process plans, we take into account in our Petri net model of manufacturing process planning the costs caused by machine, setup and tool changing in addition to pure operation cost" (Abstract).

Kiritsis et al. further teaches that the Petri net model approach takes "into consideration processing alternatives" (e.g. different worker types; Abstract).

It would have been obvious to one skilled in the art at the time of the invention that the system and method for drafting a production plan as taught by the combination of Costanza, DSSPS and Sparling would have benefited from modeling (calculating, determining, estimating, etc.) production costs in view of the teachings of Kiritsis et al.; the resultant system enabling users to account for costs based on processing alternatives (Kiritsis et al.: Abstract).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Costanza, U.S. Patent No. 6,198,980, teaches a system and method for drafting a supply plan for a mix-model production line(s) wherein the system/method balancing the takt time for each line by adjusting the operating hours for process or adjusting the number of resources (workers) used to perform the oprations.

- Newmark, U.S. Patent No. 6,631,305, teach a system and method for optimizing a supply plan for a production line(s). Newmark further teaches that balancing production lines based on the Takt time is well known wherein the takt time is the rate in time that a plant must maintain in order to meet customer demand.

- Greene, Production and Inventory Control Handbook (1997), teaches a plurality of well known techniques/approaches to drafting supply plans for a plurality of production lines capable of production a plurality of articles or services. For example Greene teaches the well-known concept of balancing paced production/assembly lines in the automotive industry wherein line balancing comprises: determining the output required per time period, determining the total man-hours required per unit of output at a standard operating efficiency, multiplying the output required per period by the work standard to determine the total work hours required per period, dividing the total hours in the normal work period at standard operating efficiency to find the number of people required to produce the required output and dividing the total work per unit by the optimum number of people to arrive at the theoretical work cycle for each person per unit.

- Chopra et al., Supply Chain Management (2001), teach a plurality of well know methods for drafting supply plans for a plurality of production lines capable of producing a plurality of articles or services including several approaches to managing manufacturing capacity (workforce, machine) to meet the variability of demand including time flexibility from the workforce (overtime, part-time, subcontracting, seasonal workforce, etc.) and production flexibility (e.g. multiple truck production lines for different product families wherein the production rate is changed to match demand by varying the number of workers on the and moving workers between the lines.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott L. Jarrett whose telephone number is (571) 272-7033. The examiner can normally be reached on Monday-Friday, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hafiz Tariq can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Scott Jarrett
Asst. Examiner
May 8, 2007

Beth Van Doren
Beth Van Doren
Primary Examiner
AU 3623